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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,779	06/21/2006	Hiroshi Toyoda	062680	6052
38834 7590 04/19/2010 WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036				
EXAMINER D'ANIELLO, NICHOLAS P				
ART UNIT 1793		PAPER NUMBER		
NOTIFICATION DATE 04/19/2010		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

Office Action Summary

Application No.

10/583,779

Applicant(s)

TOYODA ET AL.

Examiner

Nicholas P. D'Aniello

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8, 10, 11 and 13-26 is/are pending in the application.
4a) Of the above claim(s) 4, 10 and 15-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 6, 8, 11, 13, 14 and 24-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3-18-2010 has been entered.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-3, 5, 6, 8, 11, 13, 14 and 24-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-3 have been amended to recite the limitation "said photocatalyst particle" in line 7. There is insufficient antecedent basis for this limitation in the claim. For the purpose of examination this is assumed to be the "apatite-coated photocatalyst particles" from the previous line. Applicant is advised to simply change "particle" to "particles" to properly establish antecedent basis.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5, 6, 8, 11, 13, 14 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinori et al. (JP 2002-282703 of record) in view of Taoda et al. (USP 6,180,548 of record) and Shirakawa et al. (JP 2002-322369 a newly cited reference, a copy and abstract of which are included).

Regarding **independent claims 1-3**, Yoshinori et al. teach a photocatalyst sheet (see figure 1) comprising; a substrate (support layer 2) made of polyester (a synthetic and inorganic fiber) or nylon (an inorganic fiber) (paragraph [0021] of translation), a coated layer made of a polyvinyl chloride resin coated on both sides of said substrate (see paragraphs [0006-0007]), and a photocatalyst-containing layer (figure 1, photocatalyst grain 1) coated on at least one side of said coated layer (and therefore the photocatalysts are fairly considered part of the coated layer), characterized in that said photocatalyst-containing layer contains polyvinyl chloride resin and acrylic resin (paragraphs [0006-0007]) and PTFE resin (a fluorocarbon resin - therefore, because the photocatalysts are fairly considered part of the coated layer the coated layer contains a fluorocarbon resin), and apatite-coated photocatalyst particles (see paragraph [0013]),

the ratio of said apatite-coated photocatalyst particles to said photocatalyst-containing layer is 10-40 weight % (paragraph [0011]).

The Examiner notes that claimed limitation of "photocatalyst sheets are mutually thermally welded" is drawn to a product by process limitation, however per MPEP 2113: The patentability of a product does not depend on its method of production. In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). In the instant case, the product set forth in product-by-process claims 1-3 (as claimed) are the same as that set forth by Yoshinori et al., above.

As the apatite coated photocatalyst particles disclosed by the reference are indistinguishable from those of the instant claim the particles of Yoshinori et al. are reasonably expected to have low water solubility (especially because "low" is not explicitly defined).

The limitation "the coating quantity of said apatite coated on said photocatalyst particles is such that the weight loss ratio of the whole of said photocatalyst sheet is 10% or less when ultraviolet light of intensity of 18 mW/cm² is irradiated for one hour on the surface of said photocatalyst sheet," **is conditional (when...irradiated) and does not positively limit the photocatalyst sheet.** In any event, the coating quantity of Yoshinori et al. is expected to have the same properties as the coating is deposited in the same quantity as the instant claim (10-40wt%) absent any evidence to the contrary.

Additionally, as the photocatalyst sheet of the prior art is structurally indistinguishable from the claimed sheet it is reasonably expected to have a water contact angle of said photocatalyst sheet surface is 130 degrees or less.

The amended peeling rate limitation is still not positively required as the sheets are not positively required to be thermally welded.

In regard to the particle size, Yoshinori et al. acknowledges that the surface area of the photocatalyst play an important role in the catalytic activity of the titanium oxide (paragraph [0013]) and discloses the use of fine (i.e. small) titanium oxide particles (see example 3) but does not specifically disclose the particle size of the photocatalyst particles is 1nm to 100nm.

However, Shirakawa et al. teaches a similar resin molded photocatalyst material impregnated on a glass fiber and the desirability to use titanium dioxide particles with an average particle diameter of 6nm which results in a sheet having excellent photocatalytic properties (see abstract provided).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use titanium dioxide particles having an average particle diameter of 6nm in the sheet of Yoshinori et al. as such results in a sheet having excellent photocatalytic properties as taught by Shirakawa et al.

In regard to the amendment to independent claims 1-3, Yoshinori et al. disclose apatite coated titania (paragraph [0013]) but fail to disclose a specific apatite. However, Taoda et al. teach a similar titanium oxide coated photocatalyst where the surface of the titania is coated with apatite hydroxide because this form of apatite absorbs bacteria in water or air which can be decomposed by the photocatalyst (column 3 line 66 - column 4 line 23). Please note: Apatite only has a few forms and the disclosure of "an apatite" as recited by Yoshinori et al. would be understood by one of ordinary skill in the art to

include the common forms of apatite of which all are recited in the claim except bromapatite. In other words, "an apatite" as disclosed by Yoshinori et al. would be sufficiently specific to obviate the common forms of apatite recited in the claim because apatite necessarily has a negatively charged ion of either F, Cl, OH or Br attached.

However, it would have been obvious to one of ordinary skill in the art at the time of the invention to use apatite hydroxide as the apatite coating in the photocatalyst sheet of Yoshinori et al. as this is a known effective form of apatite for photocatalyst coatings as exemplified by Taoda et al.

In regard to **claim 5**, the apatite-coated photocatalyst particles fixed in said photocatalyst containing layer have parts exposed from the surface of said photocatalyst containing layer (figure 1, paragraph [0013]).

In regard to **claim 6**, the apatite-coated photocatalyst particles are the photocatalyst particles either a part of the surface of which is coated with apatite, or a whole surface of which is coated with porous apatite (paragraph [0013]).

In regard to **claim 8**, the photocatalyst sheet is either or both of an ultraviolet light responsive type and a visible light responsive type (such as TiO₂ alone or in combination with others paragraph [0012]).

In regard to **claim 11**, the apatite-coated photocatalyst particles are fixed with the resin or rubber constituting said photocatalyst-containing layer (figure 1, paragraph [0013]).

In regard to **claim 13**, the resin is either of vinyl chloride, polyethylene, polypropylene, fluorocarbon, and polystyrene resins (as applied above, paragraph [0007]).

In regard to **claim 14**, the fluorocarbon resin is polytetrafluoroethylene (PTFE) (as applied above, paragraph [0013]).

In regard to **independent claims 24-26**, these claims are identical in scope to claims 1-3, respectively, only differing in the preamble requiring two or more photocatalyst sheets that are mutually welded to each other. However, Yoshinori et al. teach that the sheets may be thermally welded together (paragraph [0022]). As this mutual welding results in a thermally welded photocatalyst sheet that is indistinguishable from that of the claim; the peeling rate of two sheets mutually welded together in the photocatalyst sheet of Yoshinori et al. is reasonably expected **to be capable** of being peeled at a rate of 50mm/min absent evidence to the contrary.

Response to Arguments

Applicant's arguments have been fully considered but they are not persuasive. Specifically, applicant argues that there is nothing to suggest that the sheets (of the prior art) are capable of being peeling from the substrate under the conditions as recited in the claims. However, the Examiner notes that it is applicant's burden to prove that the product of the prior art will not behave in the manner given that the combination of the

references above meets all the structural limitations of the claim and is therefore reasonable assumed to behave in the same manner. It has been held that:

When the reference discloses all the limitations of a claim except a property or function, and the examiner cannot determine whether or not the reference inherently possesses properties which anticipate or render obvious the claimed invention but has basis for shifting the burden of proof to applicant as in *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02.

When the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to applicant to establish that their product is patentably distinct and not the examiner to show the same process as making. *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324.

When the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

The fact that there is no description of a peeling test in the prior art is immaterial as the reference clearly discloses the sheets are capable of being welded, and therefore they are reasonable assumed to be capable of being peeled apart in the claimed manner. Applicant has not provided factual evidence to the contrary.

The argument that there are no real structures or examples for the textile structures disclosed is not persuasive because the structure of the prior art is indistinguishable from the claimed photocatalyst sheet and the claims do not require any textile related limitations which would preclude the structure of the prior art.

As noted above and previously, properties such as the contact angle, low water solubility, peeling rate and the weight loss ratio are all inherent material properties that do not distinguish the product from the prior art because the prior art is silent regarding these properties and because the prior art has the same structure it is reasonable assumed to have these properties absent concrete evidence to the contrary. If the reference had disclosed a different value for these material properties than these limitations would preclude the prior art however absent the disclosure of a property that falls out of the claimed range or evidence that such would not naturally flow from the structure of the prior art the Examiner must maintain the position that the structure of the prior art would naturally contain the claimed properties.

In regard to the amendment, Yoshinori et al. teaches the titanium dioxide may be coated with an apatite. Apatite only has a few forms and the disclosure of "an apatite" as recited by Yoshinori et al. would be understood by one of ordinary skill in the art to include the common forms of apatite of which all are recited in the claim except bromapatite. In other words, "an apatite" as disclosed Yoshinori et al. would be sufficiently specific to obviate the common forms of apatite recited in the claim because apatite necessarily has a negatively charged ion of either F, Cl, OH or Br attached.

In any event, the use of the claimed apatite for coating titania in photocatalyst applications is taught by Taodo et al. and does not impart patentability to the claims. As coating with apatite is known in the art, discovering an optimum amount of coating for a desired function is well within the purview of one of ordinary skill in the art and such does not impart patentability to the claims because it has been held that:

Where the general conditions of the claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. (In re Aller, 220 F.2d 454, 456 (CCPA 1955)).

In regard to the range for the content of the photocatalyst, Yoshinori et al. discloses a range (5-70%) that completely encompasses the claimed range (10-40%), and applicant argues that this range is not specific enough to anticipate the claimed range. However, this rejection is based on the concept of obviousness, not anticipation, and the range disclosed by Yoshinori et al. clearly obviates the claimed range. Applicant has not provided any evidence that the claimed range is critical to the performance of the photocatalyst sheet, which would be a secondary consideration and could possibly rebuke the obviousness of the claimed range.

Finally, as noted above, Yoshinori et al. discloses the use of fine titanium dioxide powder but does not disclose a specific size. A newly cited reference, Shirakawa et al. teaches a similar photocatalyst material impregnated on a fibrous material and the desirability to use 6 nm size particles because such results in a sheet with excellent photo-catalytic properties. Also noted above, as Yoshinori et al. recognizes that the surface area of the titanium dioxide is important for photo-catalytic activity, the use of

such fine particles would have been obvious because small particles have a larger surface area/weight ratio and therefore the finer the particles the greater the catalytic activity.

Inquiries

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas P. D'Aniello whose telephone number is (571)270-3635. The examiner can normally be reached on Monday through Thursday from 8am to 5pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. P. D./

Examiner, Art Unit 1793

/Jessica L. Ward/

Supervisory Patent Examiner, Art Unit 1793